

CSADPRG MCO Specifications

Specifications for Comparative Analysis on Programming Languages

1. Activity Description

The activity serves to support the theoretical foundations of programming languages discussed in class, by surveying, comparing, and evaluating the features and constructs of different programming languages. For this iteration of the MCO, all groups are tasked to study Go, Kotlin, R, and Ruby. The project has three components, namely a language evaluation paper, a running application software, and a class presentation. By the end of the project, students should have acquired an understanding of the different paradigms supported by various languages and appreciate the similarities and differences in their language features.

2. Software Application – PH Tax Calculator

Using one of the specified programming languages (i.e. Go, Kotlin, R, and Ruby), your group is asked to implement a Tax Calculator for the revised Philippine Tax Table for 2022. Given the monthly income, the calculator will automatically compute for (1) the monthly income tax, (1) the monthly SSS, Pag-ibig and Philhealth contributions, (3) the total deductions, and (4) the net monthly pay. You may refer to <https://taxcalculatorphilippines.com/> for how these items are computed.

Please note that you're only required one implementation (i.e., usage of one language), so your group is allowed to select a programming language from what was specified. However, despite only being required to use one language, your group would best explore each of the four languages for their strengths and weaknesses before implementation. Some languages may not be a good fit for the problem described above despite having the capacity to solve the problem. It might be beneficial for your group to explore implementation in other languages – particularly as you're expected to discuss the strengths and weaknesses of each of the languages in the evaluation paper.

3. Evaluation Paper

The language evaluation paper contains a detailed discussion of the features and constructs of Ruby, R, Kotlin and Go. Using code snippets, the research paper also includes an evaluation of the language with respect to the theories and concepts discussed in class. One section should discuss how specific features of a programming language aided in the implementation of the Tax Calculator. The required contents for the evaluation paper vary among languages, depending on the programming paradigm. The outline of the paper is given in Section 5.

Format

Margin:	1 inch margin (all sides)
Font:	12pt Times New Roman for discussion 11pt Bold Courier New for code segments
Paper:	Short (8"x11")
Spacing:	Single (except between paragraphs)

IMPORTANT!

Groups that simply "copy and paste" materials from different sources will automatically be given a grade of 0 for the project. The contents of the paper are dependent on the source code of your specific application. Concepts and theories may be paraphrased from reference materials but must be properly cited. Documents with no citations will receive deduction points.

Citation

We will follow the American Psychological Association (APA) format for citations. In the APA format, the author-date method of citation is followed. This means that the author's last name and the year of publication for the source should appear in the written report, and a complete reference should appear in the reference list.

Examples:

Smith (1970) compared reaction times . . .

In a recent study of reaction times (Smith, 1970), ...

In 1970, Smith compared reaction times . . .

4. Grading Scheme

Software Application	35 pts
Language Evaluation Paper	45 pts
Class Presentation	20 pts.

Language Paper Evaluation (35 pts)

1. Completeness (Did you cover everything?) 25pts
2. Relevance (Did you cover the right thing?) 10pts
3. Clarity and Organization 10pts

Class Presentation (20 pts)

1. Significance of the Discussion 10pts
2. Clarity and Organization of the Presentation 10pts

Each group is allotted 20 minutes to present its software application and programming language in class. The goal of this exercise is to provide a venue for sharing new knowledge regarding the various languages and paradigms.

5. Project Schedule and Deliverables

Language Evaluation Paper

Apr 13, 2023

The evaluation paper must be submitted on Canvas by 1159. Late submissions will not be accepted, and the group will automatically be given a grade of 0 for the paper. The evaluation paper should have the following contents:

- Title Page

An Evaluation Paper on
<Programming Languages>
:
submitted
in partial fulfillment of the requirements
for the course CSADPRG
:
<name of member – 1 per line, arranged in alphabetical order based on surname>
:
<CSADPRG teacher>
<date>

1. Introduction

This section introduces the programming paradigms of the different languages. Present an overview of the languages – history, revisions, current state, and future directions. Relate them to each other. Discuss the application domain which your language is most suited for.

2. Language Comparison

In this section, discuss the major features of the different languages. Explain as well how the features (capabilities and constraints) of the languages can make the software development process easier and/or more difficult. Provide code snippets to clarify the discussion.

3. Developing the Tax Calculator using <Programming Language>

In this section, introduce your software application by highlighting its major functions. Discuss how the chosen language of implementation made it easier and/or hindered the development.

6. Conclusion

In this section, summarize what you have learned. Say something about the languages, share your learning experiences, explain if your application is appropriate for the languages, and other recommendations you may have.

References

The following are examples of correct listing of references.

Online Material

Author, A. A. (Date of Publication or Revision). Title of full work [online]. Available: full web address. (Date of access).

* Date of access" should indicate the date you visited the website. This is important because online information is frequently altered.

Sample 1:

Daly, B. (1997). Writing argumentative essays. [online]. Available: <http://www.eslplanet.com/teachertools/argueweb/frntpage.htm>. (May 12, 1998)

Sample 2

The Evolution of Truth: Phi & Fibonacci Anomalies [online]. Available: <http://evolutionoftruth.com/fiv/fibomyst.htm>. (September 7, 2004).

Book

Calfee, R. C., & Valencia, R. R. (1991). APA guide to preparing manuscripts for journal publication. Washington, DC: American Psychological Association.

An article or chapter of a book

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), Gender issues across the life cycle (pp. 107-123). New York: Springer.

Submit a copy of your slides by April 12. The class presentations will be on April 14-15.

The presentation must focus on the following items:

- Overview of the programming paradigm
- Brief history of the programming language
- Software demo
- Source code discussion, to showcase the important features and capabilities of the programming languages (Note that only important features and capabilities that implement your data structures and algorithms must be presented in class!)